

WHAT IS CLAIMED IS:

1. An electronic apparatus for use in a parking system, said apparatus comprising:

a housing;

a microcomputer disposed within said housing;

a time monitoring crystal electrically coupled to said microcomputer to generate accurate timekeeping;

a display means electrically coupled to said microcomputer, said display means externally located on a face of said housing;

at least one momentary switch for operating said apparatus; and

a battery to power to said apparatus.

2. An apparatus as in claim 1, further comprising four momentary switches for entering data and programming said apparatus.

3. An apparatus as in claim 2, further comprising an infrared serial interface coupled to said microcomputer, said interface includes a light emitting diode and an infrared diode used to send and receive data through said face of said housing.

4. An apparatus as in claim 3, wherein said microcomputer further comprises an internal read-only memory (ROM) with a capacity of 16K words for storing programs, bit maps and tables.

5. An apparatus as in claim 4, wherein said microcomputer further comprises an internal random access memory (RAM) with a capacity of 3500 nibbles for storing parking parameters and random codewords.

6. An apparatus as in claim 5, wherein said microcomputer further comprises an internal clock divider to generate 1/2 Hz and 1/16 Hz clock signals.

7. An apparatus as in claim 6, wherein said microcomputer further comprises an internal battery checking circuit.

8. An apparatus as in claim 7, wherein said crystal operates at 32,768 KHz.

5 9. An apparatus as in claim 8, wherein said display means is a liquid crystal display (LCD).

10. An apparatus us in claim 9, wherein said liquid crystal display comprises 1024 pixels organized as on array of 16 rows by 64 columns.

10 11. An apparatus as in claim 10, further comprising a temperature sensing circuit, said temperature sensing circuit includes a NTC thermistor, a resistor and a capacitor connected in parallel.

15 12. An apparatus as in claim 11, wherein said microcomputer further comprises a LCD electrical interface coupling said microcomputer to said liquid crystal display, said LCD interface controls bias voltages to said liquid crystal display in response to an input to said microcomputer from said temperature sensing circuit.

13. An apparatus as in claim 1, wherein said apparatus is disposed in an automobile such that said display means can be viewed from a location external to said automobile.

20 14. An apparatus as in claim 1, further comprising a motion detecting means, said motion detecting means terminates active parking upon detecting motion.

15. An apparatus as in claim 9, wherein said liquid crystal display includes a controllable segment, said segment allows light to pass through said display when off and blocks light when said segment is on.

25 16. An apparatus as in claim 15, further comprising a corner cube to reflect light back to its source, said corner cube being disposed behind said segment of

said LCD display, whereby upon light being directed at said corner cube said segment will be turned on and off to passively transmit data from said apparatus.

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17. An electronic parking system, said system comprising:

an in-car parking meter having a first data transferring means, said meter being disposed in an automobile such that said meter can be viewed from a location external to said automobile, and

5 a transceiver having a second data transferring means, said second data transferring means configured to communicate with said first transferring means of said in-car parking meter.

18. A system as in claim 17, wherein said in-car parking meter comprises:

10 a housing;

a microcomputer disposed within said housing;

a time monitoring crystal electrically coupled to said microcomputer to generate accurate timekeeping;

15 a display means electrically coupled to said microcomputer, said display means externally located on a face of said housing;

at least one momentary switch for operating said apparatus; and

a battery to power to said apparatus.

19. A system as in claim 18, wherein said in-car parking meter further comprises four monetary switches for entering data and programming said in-car parking meter.

20 A system as in claim 18, wherein said first data transferring means is an infrared serial interface coupled to said microcomputer, said interface includes a light emitting diode and an infrared diode used to send and receive data through said face of said in-car parking meter.

21. A system as in claim 20, wherein said second data transferring means of said transceiver comprises a high power infrared light emitting diode and a phototransistor for sending and receiving data from said first transferring means of said in-car parking meter.

5 22. A system as in claim 21, wherein said transceiver is portable, said transceiver being carried by a parking enforcement official to read data from said in-car parking meter.

23. A system as in claim 21, wherein said transceiver is formed to receive said in-car parking meter as to block ambient light during communication between said first transferring means and said second transferring means.

24. A system as in claim 23, wherein said transceiver is positioned at an entrance to a parking facility.

25. A system as in claim 24, wherein said transceiver wirelessly transmits data from said parking facility to a remote location.

15 26. A system as in claim 19, wherein said display means is a liquid crystal display including a controllable segment, said segment allows light to pass through said display means when off and blocks light when said segment is on.

20 27. A system as in claim 26, further comprising a corner cube to reflect light back to its source, said corner cube being disposed behind said segment of said display means, whereby upon light being directed at said corner cube said segment will be turned on and off to passively transmit data from said in-car parking meter.

25 28. A system as in claim 27, further comprising an external receiver, said external receiver comprising a light point source and a photodetector which when directed toward said in-car parking meter passively receives information from said in-car parking meter.

29. A system as in claim 28, wherein said external receiver is portable, said external receiver being carried by a parking enforcement official to read data from said in-car parking meter.

30. A method of generating codewords to program an electronic apparatus with monetary credits, said method comprising the steps of:

generating a serial number associated with said electronic apparatus;

providing a hardware based crypto-grade random number generator;

5 generating a first random number table from said crypto-grade random number generator;

generating a second random number table from said crypto-grade random number generator;

10 indexing said serial number to a first entry in said first random number table and to a second entry in said second random number table;

summing said first entry and said second entry resulting in a hexadecimal sum; and

converting said hexadecimal sum into a first seven digit binary coded decimal value codeword.

5 31. The method of claim 30, further comprising the step:

providing a second seven digit binary coded decimal codeword whereby said second codeword validates said first codeword.

32. The method as in claim 31, further comprising the step of providing a storage means for storing a plurality of codewords, said storage means comprises
20 a microprocessor and non-volatile memory.

33. The method as in claim 32, further comprising the step of providing a block access code for allowing access to said plurality of codewords.